Rural Development Planning: Protect Your Health and the Environment

A Benton County Publication
# Table of Contents

## INTRODUCTION
- Introduction to the Booklet ................................................................. i
- Quick Contact List ................................................................................. ii, iii

## DEVELOPMENT
- Site Development ................................................................................ 1
- Land Clearing & Replanting ............................................................... 2
- Weeds & Invasive Plants .................................................................... 3
- Protect Water Quality & Habitat ....................................................... 4
- Indoor Air Quality ........................................................................... 5, 6
- Green Building ................................................................................. 6

## WATER
- Water Conservation ............................................................................ 7
- Hydrological Cycle ........................................................................... 8
- Water Quality .................................................................................. 9
- Watersheds ...................................................................................... 10
- Watershed Councils & Conservation Districts .................................. 11
- Well Water ....................................................................................... 12, 13
- Wetlands .......................................................................................... 14

## SEPTICS SYSTEMS
- Septic Systems .................................................................................. 15-19
- Septic System Enhancements ............................................................ 20-24
- Septic System Do’s & Don’ts ............................................................... 25
- Septic Maintenance & Information .................................................... 26

## ACKNOWLEDGEMENTS .................................................................... 27
Because we live in a world of increasing human population and shrinking natural resources, it is more important than ever to consider sustainability of natural systems when developing land, whether it is a city lot or rural acreage.

Taking time to consider the impact of your decisions before you build, add-on, clear land, construct a driveway, upgrade a septic system, or other project, not only helps maintain a healthy environment for the native flora and fauna; but also helps protect your health and the health of your family and neighbors. Benton County residents like you can make significant contributions by reviewing the information contained in this plan before proceeding with developments on your land.

This plan is not a list of requirements. It was developed by County officials wanting to convey recommendations and information to citizens who are interested in doing more than just the minimum code requirements. Following the recommendations in this plan will in many cases reduce future costs, minimize human impact on the environment, and help sustain the natural systems in our corner of the Earth.

Some of the helpful information you’ll find on the following pages include:

— A convenient checklist that directs you to the proper city, county, and state sources for answers to your questions about developing your land.

— Why retaining or planting native vegetation on your land prevents soil erosion, requires less irrigation, and provides vital habitat for native birds and wildlife.

— How you can work with your local watershed council and neighbors to improve water quality in your local area.

— Ways you can protect the quality of your well water and the quality of the surrounding aquifer shared by your neighbors.

— How “green” building techniques lead to healthier indoor environments and utilize sustainable, non-toxic construction materials.

— Ways you can help stop the spread of noxious weeds and invasive non-native plants that threaten our native flora.

— How you can improve your septic system so it will operate longer, saving material costs and preventing environmental damage and health risks caused by septic failures.

— And lots more. . . !

Revised March 2013
Property development can be a complicated process. The list below is intended to help you through the four different stages: planning, preparing for development, actual development, and ongoing maintenance.

1. **PLANNING HOW YOU WILL DEVELOP THE PROPERTY**
   Check with your Community Development Department for zoning compliance; land use, setbacks, and other regulations.

   Obtain property maps (tax lot map, aerial photo, survey, floodplain, etc.) from Benton County Development Department, 360 SW Avery Ave, Corvallis, OR 97333. Check availability of utilities (contact utility companies).

2. **PREPARATION FOR DEVELOPMENT**

   **For any of the following issues...**
   **...contact:**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stream crossing or relocation</td>
<td>Oregon Division of Lands (503) 986-5200</td>
</tr>
<tr>
<td>Floodplains</td>
<td>Community Development (541) 766-6819</td>
</tr>
<tr>
<td>Geological hazards</td>
<td>Community Development (541) 766-6819</td>
</tr>
<tr>
<td>Ponds</td>
<td>Oregon Water Resources (503) 986-0900</td>
</tr>
<tr>
<td>Wetlands</td>
<td>Oregon Division of Lands</td>
</tr>
<tr>
<td>Timber removal</td>
<td>Oregon Department of Forestry (541) 929-3266</td>
</tr>
<tr>
<td>Deed restrictions/conditional covenants</td>
<td>Land use attorney and/or your Homeowners Association if your subdivision has one</td>
</tr>
</tbody>
</table>

   **Road Access**

   **If you access property from this type of road...**
   **...to obtain an Access Permit contact:**

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Highway (i.e., Hwy 99, Hwy 34, Hwy 20 etc.)</td>
<td>Oregon Department of Transportation Corvallis office (541) 757-4104</td>
</tr>
<tr>
<td>Non-county public road</td>
<td>Benton County Public Works (541) 766-6821</td>
</tr>
<tr>
<td>County road</td>
<td>Benton County Public Works (541) 766-6821</td>
</tr>
</tbody>
</table>

   **Sewage Disposal**

   **If you are...**
   **...contact:**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside City limits (connect to City)</td>
<td>Development Services (541) 766-6929</td>
</tr>
<tr>
<td>Inside a County Service District (connect to Service District)</td>
<td>Benton County Public Works (541) 766-6821</td>
</tr>
<tr>
<td>Not in City or a Service District (obtain permits to install septic)</td>
<td>Environmental Health (541) 766-6841 and Community Development (541) 766-6819</td>
</tr>
</tbody>
</table>
# Quick Contact List

## Water:

<table>
<thead>
<tr>
<th>If you are…</th>
<th>…contact:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside City limits</td>
<td>Connect to Corvallis City water service</td>
</tr>
<tr>
<td></td>
<td>(541) 766-6949</td>
</tr>
<tr>
<td>Water districts (i.e., Alsea Service</td>
<td>Operator of the water district, or to connect with</td>
</tr>
<tr>
<td>Dist., Cascade View Estates, etc.)</td>
<td>a County service district - Benton County Public</td>
</tr>
<tr>
<td></td>
<td>Works</td>
</tr>
<tr>
<td></td>
<td>(541) 766-6821</td>
</tr>
<tr>
<td>Not in City or service district</td>
<td>To obtain well requirements/Benton County</td>
</tr>
<tr>
<td></td>
<td>Environmental Health (541) 766-6841</td>
</tr>
</tbody>
</table>

## DEVELOPMENT

<table>
<thead>
<tr>
<th>To apply for or find out about…</th>
<th>…contact:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building permits &amp; inspections</td>
<td>Benton County Community Development Department</td>
</tr>
<tr>
<td></td>
<td>(541) 766-6819</td>
</tr>
<tr>
<td>Septic system inspections</td>
<td>Benton County Environmental Health</td>
</tr>
<tr>
<td></td>
<td>(541) 766-6841</td>
</tr>
<tr>
<td>Driveway connection to road</td>
<td>Benton County Public Works/Roads</td>
</tr>
<tr>
<td>(road approach inspections)</td>
<td>(541) 766-6821</td>
</tr>
<tr>
<td>Fire hazards</td>
<td>Your local fire district (i.e., Corvallis, Philomath,</td>
</tr>
<tr>
<td></td>
<td>Monroe, Adair, North Albany, Blodgett-Summit, etc.)</td>
</tr>
</tbody>
</table>

## HOME & PROPERTY MAINTENANCE

| Septic maintenance & information         | Review p.22 of this book; or contact Benton County  |
|                                          | Environmental Health with questions (541) 766-6841 |
| Building modifications                    | Approval needed from Benton County Environmental   |
|                                          | Health and Community Development (541) 766-6819    |
| Spray/no spray program for control of    | Benton County Public Works (541) 766-6821          |
| roadside vegetation                      |                                                    |
| Burn permit                              | Your local fire department                        |

## Development & Environmental Health

<table>
<thead>
<tr>
<th>Development &amp; Public Works</th>
<th>Environmental Health</th>
<th>Board of Commissioners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avery Building</td>
<td>Sunset Building</td>
<td>Linda Modrell, Jay Dixon &amp; Annabelle Jaramillo</td>
</tr>
<tr>
<td>360 SW Avery</td>
<td>4077 SW Research Way</td>
<td>Old Assessment Building</td>
</tr>
<tr>
<td>Corvallis, OR 97330</td>
<td>Corvallis, OR 97333</td>
<td>205 NW Fifth Street</td>
</tr>
<tr>
<td>541-766-6821</td>
<td>541-766-6841</td>
<td>Corvallis, OR 97330</td>
</tr>
<tr>
<td>*Helpful Websites</td>
<td></td>
<td>541-766-6800</td>
</tr>
</tbody>
</table>

## Oregon Department of Forestry:

www.oregon.gov/odf

## Oregon Water Resources Department:

www.oregon.gov/owrd

## Oregon Department of Forestry:

Division of State Lands:

www.oregon.gov/dsl

## Benton County:

www.co.benton.or.us
Site Development

When developing your site, the following are considered best practice:

- Leave as much vegetation (plants, grasses, trees) on the site as possible.
- Impervious surfaces (hard surfaces that cover the ground) such as pavement do not allow rainwater to soak in. This creates runoff that can cause erosion, carrying pollutants to surface waters, and increase flood heights. Consider leaving low areas on your site to collect runoff and allow percolation.
- **Bare soil with no plant growth is prone to erosion.**
  You should cover the ground with:
  - **Best:** Native trees, shrubs, grasses, and forbs (low-growing non-grasses)
  - **OK:** Lawn grass
  - **Minimum:** Pavement, or gravel surfaces
- Consider vegetated ditches alongside your driveway.
- A two-story house uses significantly less space than a single-story house of the same square footage. This means less disturbance of the native vegetation and soil, and less impervious surface coverage.
- Rather than completely removing trees or plants that crowd your building site or block the view, consider trimming some of the limbs. This will allow you to see the view and have the lighting you want, while still retaining the environmental benefits of trees and shrubs.

Rain gutters:
Rather than tight piping individual rain gutter downspouts to a drainage way, consider draining them onto the ground. Storm water will make its way slowly to streams reducing the height of floods because the water distributes over time when entering streams. However, on hillsides or if your house contains a basement, tight-piping may be necessary to reduce the risk of landslides, erosion, or basement flooding.

Considering your area’s fire risks:
- Keep tree away from roof and build roof with metal or treated fire retardant wood
- Cover ground with native shrubs, grasses, and forbs (low growing non-grass), or at minimum lawn grass
- Remove pine needles and leaves from roof & gutters
- Maintain a 30-foot fire break around your house
- Remove tall field grass and debris from perimeter
- If possible, place driveway between forested area and the house to create a firebreak.
When planning your home site, consider the minimum area you need to disturb, and mark that area off to ensure unnecessary areas won’t be impacted.

It is better for the environment and easier for the property owner to leave natural vegetation in place and grounds undisturbed then it is to clear and restore vegetation. Any excavation, grading, and other ground disturbance should be planned for the dry months (June - September).

However, in some cases it is better to remove existing vegetation and re-plant. If existing plants are non-native invasive plants and noxious weeds, it is better to clear those and replant the area with appropriate native vegetation.

For a list of native plants and information on designing your yard with native plants, see www.willamettegardens.com or contact the Oregon State University Extension Service for advice on appropriate native plants for a specific area: http://extension.oregonstate.edu/stormwater/generate-native-plants-list

You should avoid any vegetation removal or ground disturbance near waterways or wetlands. Removal of non-native vegetation in these areas may be appropriate, but should only be done with the advice of an expert from one of the following agencies:

Benton Soil & Water Conservation District at: (541) 753-7208

Oregon Department of Fish & Wildlife: (541) 947-6000

Recommended protection areas include:

- Within 100 feet from large streams
- 50 feet from small streams (streams less than 10 feet in width are most critical)

Erosion Control:
Replant disturbed areas to minimize soil erosion. For quick, short-term stability, you can plant grass seed. For long-term stability, and natural habitat value, replant with native shrubs and/or trees.

Regulations require an erosion control permit from the Oregon Department of Environmental Quality if the disturbed area is one acre or larger (revised from 5 acres to 1 in 2003).

To reduce erosion during work and before vegetation can be established, it is best to:

- Apply straw to exposed slopes (keeps rainfall from directly striking the soil and slowing runoff and reducing erosion).
- Install silt fencing along the boundary of areas of exposed soil (this is a special fabric attached to stakes, which filters runoff water).
- Place straw bales or bio-bags every 50 feet in ditches (these trap sediment in the runoff while allowing the water to filter through).
Weeds & Invasive Plants

Noxious weeds are exotic, non-native plants listed by federal, state, or county law as damaging to public health, agriculture, recreation, wildlife, or property and are competitive and harmful to the native environment.

When introduced either accidentally or intentionally an invasive plant will out-compete native species for available resources. These plants usually arrive without their native predators and can transform entire ecosystems.

For more information on local noxious weeds and invasive plants contact: Benton County Public Works at (541) 766-6819 or their web site: www.co.benton.or.us/pw

Other Resources:

Plant Conservation Alliance/National Park Service
www.nps.gov/plants

Oregon Field Guide OPB
www.opb.org/programs/invasives

Oregon Dept of Agriculture

Federal Bureau of Land Management
www.blm.gov/wo/st/en/prog/more/weeds.html

US Department of Agriculture
invader.dbs.umt.edu/Noxious_Weeds/noxlist.asp

According to the Bureau of Land Management (BLM) noxious weeds and invasive plants do the following:

- Destroy wildlife habitat.
- Reduce opportunities for hunting, fishing, camping, and other recreational activities.
- Displace many threatened and endangered species.
- Reduce plant and animal diversity because of weed monocultures - single plant species that run over all others in an area.
- Disrupt waterfowl and neo-tropical migratory bird flight patterns and nesting habitats.
- Cost millions of dollars in treatment and loss of productivity to private land owners.

Most common noxious weeds in our area:  
Himalayan blackberry  
Meadow Knapweed  
Scotchbroom  
Knotweed  
Thistles  
Tansy Ragwort  
English Ivy
**Protect Water Quality & Habitat**

**From Bare Land to Move-in:**
Developing your land can have a sizable negative impact on the environment. Alternatively, careful planning of land development can contribute to the continued health of the environment and the health of your family. You’ll want to talk with a certified contractor and/or contact the Benton County Development and Environmental Health Departments for permits in accordance with codes, and other useful information to help you with your projects.

**Planning the layout of your home site:**
Locate structures away from streams, drainage ways, and wetlands. This reduces flood hazards and drainage problems, and improves water quality.

**Recommended setbacks:**
- 100-feet from large streams
- 50-feet from small streams

*(Benton County Code requirement is currently a minimum of 50-foot setback from large streams and 25 feet from small streams.)*

Plan your site so that lawn, parking areas, garden, house and accessory buildings (including potential future buildings) can be located away from water, wetlands, and intact natural vegetation.

Site structures in locations that minimize road/driveway construction necessary to provide access and in locations so that driveways do not have to cross streams or wetlands.

This will: save money (culverts and bridges are expensive); protect fish habitat by allowing fish to migrate; protect water and soil quality by reducing sediment entering streams; minimize removal of vegetation to prevent soil disturbance and erosion.

**Planning your site structures in locations that minimize the removal of vegetation can help:**
Protect water quality and fish habitat by paying special attention to the riparian zone, vegetation and habitat along streams or wetlands, which:
- Provide habitat for wildlife
- Reduce fire hazard

**Avoid developing on steep slopes, erosion-prone soil, or landslide hazard areas because:**
- Excavation and slope stabilization is expensive.
- Soil erosion and landslides add excessive sediments to streams, damaging fish habitat.

*(Consult the Community Development Dept. for identification of these areas on your property. Depending on the size of your development, you may need a permit from DEQ)*

**Consider fencing only the minimum area necessary:**
- such as your lawn or garden, leaving the rest unfenced to allow wildlife to move through the area.
Indoor Air Quality

Indoor Air quality is important to you and the health of your family.

Increasingly, scientific studies are showing that homes and buildings are more polluted than earlier thought.

Most people spend an average of 90% of their time indoors. The elderly, young children, and chronically ill people can spend all of their time indoors. Thus, indoor air quality is important to everyone’s health.

Indicators of indoor air pollution can be physical signs such as condensation on windows, stuffy or unpleasant odors, and mold. Health related symptoms can come from many different sources. Some common examples of indoor air pollution include: tobacco smoke, radon, molds, pesticides, paints, household cleaners, and new carpeting containing formaldehyde (For a more complete list see next page).

Some immediate and acute health problems caused by indoor air pollution include eye irritation, shortness of breath, respiratory problems, nausea, fatigue, coughing, dizziness and headaches. Chronic illnesses can include emphysema, cancer, and heart disease, which may not show up for years and may not be attributed to an indoor source. Sick building syndrome can be associated with indoor air pollution.

Due to energy conservation concerns, new buildings and homes are built tighter than ever before, so it is important to make sure that adequate ventilation is included in your building plans for healthier indoor air.

Are you informed about Radon Gas?

Radon gas contamination in homes is of increasing concern today nationally, as it is the second leading cause of lung cancer behind tobacco smoking. Radon is a colorless, odorless gas that occurs naturally from the decay of radium. It is found most everywhere, but in highest concentrations in uranium and phosphate ores. It does not present a health hazard in its natural environment until trapped and concentrated in areas where a house or building is built on rock or soil that contains uranium; it can affect your house and not the neighbors. It can enter through cracks in the foundation of your home or in areas that are open to the ground, such as around a sump pump. Simple techniques such as caulking cracks, installing a fan or a ventilation pipe, or covering up bare ground will help get rid of radon in your home.

For more information about indoor air quality and radon gas visit the following sites:
www.epa.gov/iaq/radon/pubs/
www.epa.gov/iaq/
www.radon.com/

• To order an in-home radon testing kit call 1-800-324-5928
Green building is a construction method wherein the types of materials used during the building process minimize the impact on the environment, and improve the indoor air quality of your home. Indoor air quality is improved by the use of raw and natural materials.

For more information on green building visit the following websites:

Federal Environmental Protection Agency
www.epa.gov/greenbuilding

Oregon Housing & Community Services
www.hcs.state.or.us/data_research/greenbuilding/

For programs and permits contact the Oregon Department of Environmental Quality at:
www.deq.state.or.us/programs/greenpermits/index.htm

Some sources of potential indoor air pollutants include the following:
1. Moisture/Mold
2. Pressed wood furniture
3. Contaminated humidifier
4. Moth repellants
5. Personal care products
6. Room air fresheners
7. Chemical cleaners & disinfectants
8. Pressed wood kitchen cabinets
9. Un-vented gas stove
10. Household chemicals
11. Tobacco smoke
12. Wood stove
13. Wood paneling
14. Asbestos
15. Unvented dryer
16. Radon
17. Pesticides
18. Auto exhaust
19. Auto cleaners, and additives
20. Paint, paint thinners, and wood stains
21. New carpet containing formaldehyde

Water Conservation

We know all living things on Earth must have water to survive. Approximately 70% of Earth’s surface is covered by water, but 97% of that water is saltwater, leaving only 3% as freshwater. Less than 1% of that freshwater is accessible for use by humans and animals. As the Earth’s population rises, new demands are placed on our finite supply of freshwater.

Protecting and conserving water is critical to our health and well-being. Humans can live only three days without water. It is also an essential part of our hygiene—simply washing our hands helps to stop the spread of disease. However, contaminated water can be a disease carrier and is still a major source of infectious disease transmission in some parts of the world today.

In the U.S., we are fortunate to have access to pure clean drinking water; however, billions of people (1 out of 5) around the world still lack access to clean drinking water.

Changing daily habits can save huge amounts of water

Good conservation measures include: watering lawns and gardens early morning or late evening and ONLY WHEN NEEDED.

- Use drip irrigation or soaker hoses instead of large automatic sprinklers.

- Xeriscaping is a way of landscaping using native plants that survive on normal precipitation without additional watering. For other plants, use mulch or compost beds to help retain moisture, cut down on watering, control erosion, and provide a natural fertilizer.

- Do not hose down sidewalks or driveways, INSTEAD use a broom or blower to sweep.

- Wash vehicles on the lawn with a biodegradable soap. Use a hose with a spray head that turns on and off. A running hose can waste about 100 gallons of water in the time it takes to wash your car.

- Check water meter if water usage has risen and the dial moves when no water is running, you have a leak. Leaky toilets waste up to 200 gallons of water a day. Repair leaks.

- Install faucet aerators, water constrictors and low flow plumbing fixtures.

- Run dishwasher and washing machine only when you have a full load and wash at night to conserve energy.

- Don’t let water run continuously when doing dishes, shaving, etc. Take 5-minutes showers, instead of baths. Baths use 30-50 gallons of water. Shorter shower time can also save hundreds of gallons a month.

- Keep a container of cold drinking water in the refrigerator instead of running the water until cold.
The Hydrologic Cycle

We get our water simply from rain and snow through a process called the hydrologic cycle. The hydrologic cycle continually involves the atmosphere, sun, the Earth, and water, by evaporation, precipitation, condensation, transpiration, and run-off. The cycle’s process is shown in this illustration.

The sun causes evaporation or vaporization because of absorption of heat by surface water (lakes, ocean, rivers, and streams). Plants also add water to the atmosphere by evapo-transpiration. The evaporated water travels into the atmosphere where clouds transport it through the atmosphere. It eventually condenses to rain, sleet, or snow, and then falls to Earth. The precipitation not absorbed by the Earth is called run-off.

Most domestic water in Western Oregon is provided by annual rainfall and therefore our water supply is at risk in drought years.

Groundwater: Precipitation enters through the soil and fills the spaces between the rock and soil, and eventually collects in large cavities within the Earth, called aquifers. The aquifer stores water until it is called upon for use or comes to the surface.

Artesian wells, springs, and some lakes are fed by these large underground cavities.

Surface Water: Surface water is any water run-off or water that is collected on the Earth’s surface in places such as lakes, streams, and rivers.

Information about water conservation
globalstewards.org/conserve-water.htm

About mulching— reduce watering of flower beds
aggie-horticulture.tamu.edu/archives/parsons/drought/mulches.html

Xeriscaping— landscaping that uses native plants that survive on normal precipitation for your area
www.des.state.nh.us/factsheets/ws/ws-26-4.htm
Water Quality

Water Quality Concerns:
There are two types of sources of water pollution and contamination:

- **Point source pollution** (Oregon Department of Environmental Quality monitored source pollution) comes from a specific discharge source, for example a factory or manufacturing site, storm sewer runoff, septic system, or sanitary sewer system overflow.

- **Non-point source pollution** (unintentional pollution) does not come out of a pipe or other specific discharge sources. Rather the water may include chemicals such as fertilizers and pesticides run-off from lawns, gardens, and fields, or from feedlots carrying animal wastes.

Although groundwater is filtered through rock, soil, and sand, which help to rid some pollutants, there can still be groundwater contamination. The fewer barriers that exist between the ground surface and the aquifer, the more likely the aquifer will be contaminated. The types of soil in river valleys, like those in the Willamette Valley, are called alluvial soils. Alluvial soils were formed from sediment carried by rivers and streams and deposited in the valleys and are especially vulnerable to contamination. This is because the ground lacks consolidated rock or clay that act as barriers.

For more information about Water Quality and Pollution see the EPA website:  [www.epa.gov/owow_keep/NPS/index.html](http://www.epa.gov/owow_keep/NPS/index.html)

For more information about Groundwater & Drinking Water, see the EPA website:  [www.water.epa.gov/](http://www.water.epa.gov/)

For Groundwater Stewardship information see the Oregon State University website:  [wellwater.orst.edu/](http://wellwater.orst.edu/)
Watersheds

What is a Watershed?

In general, a watershed is the area of land that drains to a common point. This may encompass the area of land draining to the mouth of a river, or a much smaller area above a river such as a creek. In order to develop an effective assessment process a consistent definition of the area to be assessed is needed. Small watersheds nest within larger watersheds.

It is important to keep the watershed in mind when land is being developed due to the possible negative impact on water quality, fish and wildlife habitat, native plants, and in turn human health.

Ways Humans Affect the Watershed

- Use of chemicals such as herbicides/pesticides and fertilizers.
- Creating run-off from building houses, roads, driveway, ditches, etc.
- Roads, buildings, pavement, and other hard surfaces reduce the ability of soil to absorb and filter precipitation. These surfaces do not allow water to enter the soil, so run-off occurs and the unfiltered water flows into road ditches and the nearest stream.

Too much run-off can cause soil and stream bank erosion, and flooding. Run-off can also pollute streams, rivers, lakes (surface water) and groundwater with substances such as sediment, pesticides, excess fertilizers, motor oil, etc. Once the surface or groundwater in the watershed is polluted and contaminated, it can cost taxpayers millions of dollars to have it cleaned up.

Resources to Watershed info:

- [www.fs.fed.us/publications/watershed/](http://www.fs.fed.us/publications/watershed/)
- [water.epa.gov/polwaste/nps/watershed/index.cfm](http://water.epa.gov/polwaste/nps/watershed/index.cfm)
Watershed Councils

Organizations that monitor watersheds are called *watershed councils*. These councils are made up of people who have an interest in a particular watershed because they live, work, or recreate there. Watershed councils have regular open meetings to work on issues of concern with people in the specific watershed area. Issues such as: pollution, fish and wildlife habitats, native plants, water quality, and conservation. If you are interested in learning more about these organizations in Benton County, contact the Benton County Community Development Department (541) 766-6819.

Soil & Water Conservation Districts

These districts are a subdivision of the state government but function on a local level; there are 45 conservation districts in Oregon. The people who direct Soil and Conservation Districts are homeowners and citizens who are elected and serve as volunteers. They are committed to the health and safety of their fellow citizens through protection and conservation of the water, natural resources, soil health, and wildlife within the districts they serve. The conservation districts are not regulatory agencies, rather they serve as technical advisors, educators, and advocates for the conservation of soil and water resources within their area. They partner with several different state and local agencies as well as the watershed councils in the district. The result is cleaner water, healthier pastures, more productive crops, forests, and wildlife habitat.

For more information on local watersheds contact:

**Alsea Watershed Council**
www.alseawatershedcouncil.org/

**Long Tom Watershed Council**
www.longtom.org/

**Luckiamute Watershed Council**
www.luckiamutelwc.org/

**Mary’s River Watershed Council**
(541)758-7597
www.mrwc.org/

**OR Watershed Board**
(coordinates councils statewide)
www.oregon.gov/OWEB/
Well Water

Planning & Maintaining Wells:

Proper planning and set up of your well will help protect you and your family from health problems and diseases from polluted drinking water.

When planning and maintaining your well the following things should be considered to prevent contamination of your drinking water. **Make sure that you follow regulations regarding distance from potential points of contamination of your well.**

Depending on your area, make sure that the well is **over 50 feet deep**. The shallower the well, the higher risk of contamination.

**Keep Well Water Clean:** Many residents in Oregon use well water as their major source of water. As a rural resident, you will most likely obtain water from a well, so care **MUST** be taken to protect your well. It is your responsibility as an owner to monitor and maintain your well water quality.

Approximately 5% of private wells in Oregon are polluted from septic tank effluent (sewage), pesticides, motor oil, nitrates, fecal bacteria, metals, and industrial solvents, all of which can cause illness.
Factors such as surface drainage and the direction in which the groundwater flows will help keep your well free from contamination. Locate the well up hill from potential contamination sources, such as a livestock yard, leaky petroleum tank, failing septic system, etc.

Abandoned wells need to be properly plugged. These present a **safety hazard** and are a direct pathway to groundwater contamination. Contact **Oregon Water Resources** on how to properly abandon a well that is no longer in use.

Consider the following regarding your well:

- **DO NOT** store pesticides, petroleum products, or fertilizers in the well house. **Keep herbicides & pesticide spraying away** from rivers, streams, lakes, ponds, etc.

- Benton County **Environmental Health recommends testing your well for more than bacterial contamination**. Please take advantage of their handout on drinking water requirements.

- **To help conserve water** during dry summers, think about limiting vegetation, using native vegetation, or use vegetation that is drought resistant or does not require a lot of water.

- **Check wells annually** in the first quarter of each year for coliform bacteria and nitrates; these are harmful to you and your family’s health and cause diseases.

Well Information: **Oregon Water Resources**
(503) 986-0900 or go to the website at: www.oregon.gov/owrd/pages/pubs/toolsdata.aspx

More information about drinking water, water quality, and wells see:

- **Extension and Experimental Stations Communications:**
  extension.oregonstate.edu/eesc/

- **Oregon State University websites:**
  extension.oregonstate.edu/catalog/pdf/em/em8651-e.pdf

- **OSU Extension Water Quality Education and Home*A*Syst Program,** (541) 737-6294
  www.hydroville.org

- **Federal Environmental Protection Agency:**
  water.epa.gov/drink/index.cfm

- **Oregon Department of Environmental Quality (DEQ),**
  1-800-452-4011
  www.oregon.gov/DEQ/Pages/index.aspx

- **Oregon Health Division,**
  Drinking Water Section
  (503) 731-4010
  public.health.oregon.gov/HealthyEnvironments/DrinkingWater/Pages/index.aspx
Wetlands

What are Wetlands?
Wetlands are areas where the land and the water combine to form a unique environment. The area has water at or near the ground surface during enough of the year that special plants grow and unique processes occur within the soil and the water. In other words, where the “water table” is high enough to create a swampy type area. Wetlands serve several purposes:

- They help improve and protect surface water quality (lakes and streams) by filtering and cleaning pollutants from the water; this helps keep the environment clean and your drinking water free from pollutants that could potentially harm you and your family.

- They serve as a natural flood control and erosion control by allowing floodwater a place to go before it gets to higher ground. This protects your home and will help stop floods that can destroy your investment and damage your family’s health. Floodwater can potentially carry raw sewage, bacteria, and disease, posing health hazards.

- They provide quality environments for wildlife, birds, fish, and native plants and give you and your family a natural park where you can enjoy watching wildlife and birds.

For years humans destroyed wetlands by building over them. This practice has created several problems with environmental quality, wildlife, birds, and native plant habitats. We are now beginning to reclaim some of these wetlands and have laws in place to protect wetlands.

To learn more about wetlands and regulation, contact the Oregon Division of State Lands (503) 986-5200 www.oregon.gov/dsl/WETLAND/Pages/index.aspx

Wetland rules and regulations fact sheets can be found at www.oregon.gov/dsl/WETLAND/Pages/wetlandfacts.aspx

US Army Corps of Engineers: (503) 808-4761 www.nwp.usace.army.mil/

Environmental Protection Agency (EPA): water.epa.gov/type/wetlands/index.cfm

Federal and state laws protect wetlands
The presence or absence of wetlands can only be determined with certainty by a trained person visiting the site. However, some signs indicate the presence of wetlands in a certain area. The Benton County Community Development Department can assist you with these indicators. However, remember that ALL wetlands are regulated, not just those that appear on indicator maps.
Introduction to Septic Systems
Septic systems are designed to provide sewage treatment and disposal for homes not served by a community sewer. A well designed, installed, and maintained septic system can provide years of reliable low-cost service. When these systems fail to operate effectively, property damage, groundwater and surface water pollution, and disease outbreaks can occur. Therefore, it makes good sense to understand and care for your septic system.

There are many different types of septic systems to fit a wide range of soil and site conditions. The following information will help you to understand a conventional gravity flow septic system, and keep it operating safely and avoid costly repairs.

A septic system consists of a septic tank, a distribution box, a drainfield with its replacement area and the surrounding soil.

The Septic Tank
A typical septic tank is made of concrete, fiberglass, or polyethylene. Wastewater from your toilet, bath, kitchen, laundry, etc. flows into the tank. Heavy solids settle to the bottom to form a sludge layer where bacterial action partially decomposes them to digested sludge and gases. Most of the lighter solids, such as fats and grease rise to the top and form a scum layer.
Septic Systems

Septic tanks may have one or two compartments. Two compartment tanks do a better job of settling solids and are recommended for new and existing systems. Tees or baffles are provided at the tank’s inlet and outlet pipes. The inlet tee slows the incoming wastes and reduces the disturbance of the settled sludge. The outlet tee keeps the solids or scum in the tank. All new tanks require accessible riser covers to the ground surface for checking the condition of the baffles and for pumping the tank. This allows access to the tank without digging up the yard each time maintenance is required. If riser covers extend from the tank to the ground surface, they should be secure to prevent accidental entry into the tank.

Solids that are not decomposed remain in the septic tank. If not removed periodically by a licensed pumper, solids will accumulate until they eventually overflow into the drainfield. Most septic tanks need to be pumped every 3 to 5 years, depending on the tank size and the amount and type of solids entering the tank. Regardless, the septic tank should be pumped whenever:

- The bottom of the scum layer is within 3 inches of the bottom of the outlet tee or baffle, or
- The top of the sludge layer is within 12 inches of the bottom of the outlet tee or baffle.
Septic Systems

Some septic tank additives on the market with chemicals, yeast, bacteria, or enzymes claim to improve septic tank performance or reduce the need for routine pumping. Such products are not necessary for the proper functioning of a septic tank and may actually harm your septic system. Some can cause solids to carry over to the drainfield, which results in early clogging and a need for a new drainfield. Products containing organic solvents contribute to groundwater pollution.

The wastewater leaving the septic tank is a liquid called effluent. It has been partially treated but still contains disease causing viruses, bacteria, and other pollutants. Discharging effluent onto the ground surface or into surface and ground water creates a significant health hazard and is against Oregon State Law.

The Drainfield
After the partially treated wastewater leaves the septic tank outlet, it flows into a distribution box (level site) or drop box (sloping site) that separates the flow into a network of drainfield trenches. Drainage holes at the bottom of each line allow the wastewater to drain into gravel trenches for temporary storage. This effluent then slowly seeps into the subsurface soil where it is further treated and purified by soil bacteria. Every new drainfield is required to have a designated replacement area. If the existing system fails, there will be adequate area to install a new drainfield.
The Soil
The soil below the drainfield provides the final treatment and disposal of the septic tank effluent. After the effluent has passed into the soil, most of it percolates downward and outward, eventually entering the groundwater. A small percentage is taken up by plants through their roots, or evaporates from the soil.

The soil filters effluent as it passes through the pore spaces. Chemical and biological processes treat the effluent before it reaches the groundwater, or a restrictive layer, such as a hardpan, bedrock, or clay soils. These processes work best where the soil is somewhat dry, permeable, and contains air for several feet below the drainfield.

The Permitting Process
There are two steps involved in the permitting process for Benton County.

Step 1: Site Feasibility
Getting a Site Feasibility approval is Step 1. The suitability of a proposed site for a septic system is largely determined by the type and depth of soil and the depth to the water table. Other factors include the size of the property, how steep the site is, location of the system relative to streams, wells, cuts, and fills, and whether sewer service is available. There must also be enough area available for a full replacement system in case the initial system fails. As part of your application, you must provide at least 2 test pits approximately 75 feet apart in the proposed drainfield area. These criteria are identified in Oregon Administrative Rules (OAR) Chapter 340, Division 71 and Division 73.

Step 2: The Permit
Getting a Construction-Installation permit is Step 2. With a favorable Site Feasibility in hand, you may apply for the permit, which must be obtained before installation of the septic system can begin. If you have questions about the process or would like to obtain an application, please contact Benton County Environmental Health at: (541) 766-6841 or visit our web site at www.co.benton.or.us/health/

Septic Systems used in Benton County
There are many types of septic systems used today. While all septic systems are individually designed for each site, most septic systems are based on the same principles. The following diagrams are some systems used in Benton County.
Septic Systems

Standard System

Drainfield *

Sand Filter System

Sand Filter (360 sq ft)

Alternative Treatment Technology (ATT)

ATT (20 sq ft)

*Note:
The number of drainfield lines and line lengths vary based on the design of the system specific to the property. Drainfield trenches include Standard, Capping Fill, Pressurized Distribution, Steep Slope (30-45%), Saprolite, Redundant, and Seepage Trenches. They are subject to specific requirements defined by Oregon Administrative Rules (OAR) Chapter 340 – Divisions 71 & 73.
Enhancing your Septic System
When you obtain a permit, you will be given the minimum code requirements to install a septic system on your property. Below are some options available to enhance the efficiency of your septic system or to make maintenance practices more convenient. Note: It is not Benton County’s intent to endorse one product over another, but to inform readers about options on the market.

Septic Tank Enhancements (Gravity System)

- Increase the size of your septic tank to allow for better treatment of the waste stream and removal of solids.
- Use a 2-compartment tank to further separate the solids and to prevent them from entering the drainfield.
- Install a relatively inexpensive effluent filter in the septic tank outlet baffle to remove suspended solids from the effluent before they enter the drainfield.
- Install access riser(s) on the tank for easy identification, inspection, and maintenance (required for all new installations).
- Install a high level alarm to detect problems in the tank.
Septic System Enhancements

Septic Tank Enhancements (Pump System)

- Increase the size of your septic tank to allow for better treatment of the waste stream and removal of solids.

- Use a 2-compartment tank to further separate the solids and preventing them from entering the drainfield.

- Install a relatively inexpensive effluent filter in the septic tank pump vault to remove suspended solids from the effluent before they enter the drainfield.

- Install access riser(s) on the tank for easy identification, inspection, and maintenance (required for all new installations).

- Install high level and low level alarms to detect problems in the tank.
Septic System Enhancements

Drainfield Enhancements

- Increase the size of the drainfield if additional approvable area is available.
- Protect initial & replacement area from vehicular traffic, livestock, or other activity that may harm the drainfield. Use fencing or other barriers to isolate the initial and replacement drainfields.
- Add “risers” to either the distribution box (level site) or the drop boxes (sloping site) for easy inspection. This allows for inspection of the drainlines without digging up the yard each time.
- “Speed Levelers” can be used in a distribution box to direct the flow or “rest” portions of the drainfield.
- “Hydrosplitters” can be used with a septic system on a slope that utilizes a pump. They are used in place of drop boxes to distribute the effluent evenly to each drainline and can extend the life of the system.
- “Programmable Timers” can be used with pumps to provide small doses to the drainfield throughout the day instead of at peak morning and early evening hours, while allowing the system to rest at night.
Septic System Enhancements

Drainfield Media

Different types of drainfield media are available for installation of the trenches. You can discuss these options with Environmental Health or your installer.

Gravel & Perforated Pipe

EPS Gravel Substitute

Chamber with no Gravel
Septic System Enhancements

Monitoring Ports
Monitoring ports can be installed in each trench to allow owners to check effluent levels and easily locate the end of each drainline. Note: A distribution box (level site) or drop boxes (sloping site) with risers to ground surface can also be used to check effluent levels in the trench.

System Installation
- Installation of the system requires the property owner to apply for and obtain a permit. The installation permit expires one year from the date it was issued.
- Installation of the system has to be done by a DEQ licensed installer or the property owner.
- The system installation must comply with all requirements of the DEQ and all conditions of the permit.
- Because of our weather, the best time to install a system in Oregon is in the summer.
- When your system is ready for a final inspection, submit a completed as-built diagram and materials list to Benton County Environmental Health on the form provided with the permit. This is required prior to inspection of the system.
- Immediately after installation and inspection, cover the system with dirt. Plant a cover crop, such as annual and perennial grass cover mixture. This will minimize erosion and prevent untreated or partially treated sewage from surfacing onto the ground.
- Benton County will issue a Certificate of Satisfactory Completion (CSC) once the system has been properly installed and inspected. A CSC is required prior to connection to the system.
Septic System
Do’s & Don’ts

DEQ Recommendations:

**DON’T** ever enter inside your tank; any work to the tank should be done from outside. **Gases generated in the tank and/or oxygen depletion can be fatal!**
**DO** call a professional whenever you experience any problems with your system.

**DON’T** flush material that will not easily decompose, such as hair, diapers, cigarette butts, matches, or feminine hygiene products.
**DO** conserve water to avoid overloading the system.

**DON’T** use a garbage disposal.
**DO** compost your food waste.

**DON’T** wash or flush medicines or hazardous chemicals like paint, paint thinner and bleach into the system. They kill the bacteria needed to decompose wastes in the septic tank and drain field.
**DO** use substitutes for household hazardous waste.

**DON’T** drive over the septic tank or drain lines.
**DO** learn the location of your septic tank and drain field. Keep a sketch of it handy with your maintenance record for service visits.

**DON’T** plant anything over or near the drain field except grass. Roots from nearby trees or shrubs may clog and damage drain lines.
**DO** cover the drain field with grass to prevent erosion and remove excess water.

**DON’T** dig in your drain field or build anything over it, and **DON’T** cover the drain field with a hard surface such as concrete or asphalt.
**DO** keep your septic tank cover accessible for inspections and pumpings. Install risers if necessary.

**DON’T** make or allow repairs to your septic system without obtaining the required permit. Use professionally licensed septic contractors when needed.
**DO** keep a detailed record of repairs, pumpings, inspections, permits issued, and other maintenance activities.

**DON’T** use septic tank additives. These products usually do not help and some may even be harmful to your system.
**DO** divert other sources of water, like roof drains, house footing drains, and sump pumps, away from the septic system. Excessive water keeps the soil in the drain field from naturally cleansing the wastewater.

**DON’T** allow backwash from home water softeners to enter the septic system.
**DO** have your septic tank pumped out regularly by a DEQ licensed contractor.
A list of licensed septic tank maintenance companies and more information about septic systems within Benton County are available from:

**Benton County Environmental Health**  
4077 SW Research Way  
Corvallis, OR 97333  
Telephone 541-766-6841  
TTY: 541-766-6835  
FAX: 541-766-6248  
Website:  [www.co.benton.or.us/health/environmental_health/sewage_disposal.php](http://www.co.benton.or.us/health/environmental_health/sewage_disposal.php)

This website includes the handout, "A Homeowner’s Guide to Septic System Maintenance and Operation." Other handouts are available at the office of Environmental Health at the address noted above.

You can obtain more information on septic systems online, or at the DEQ Consumer Corner by visiting or calling their office at:

**Oregon Department of Environmental Quality (DEQ)**  
811 SW Sixth Avenue  
Portland, OR 97204-1390  
Telephone: (503) 229-5696  
Toll Free in Oregon: (800) 452-4011  
TTY: (503) 229-6993  
Fax: (503) 229-6124  
E-mail: deq.info@deq.state.or.us  
DEQ Website: [www.deq.state.or.us/](http://www.deq.state.or.us/)  
Consumer Corner: [www.deq.state.or.us/wq/onsite/onsite.htm](http://www.deq.state.or.us/wq/onsite/onsite.htm)

Another helpful website can be found from Oregon State University:  
[wellwater.oregonstate.edu/html/septicsystems.htm](http://wellwater.oregonstate.edu/html/septicsystems.htm)
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